

**PROGAMOTAENIA ABIETIFORMIS SP. NOV. (CESTODA : ANOPLOCEPHALIDAE)
FROM ONYCHOGALEA FRAENATA (MARSUPIALIA: MACROPODIDAE) FROM
CENTRAL QUEENSLAND**

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Summary

TURNI, C. & SMALES, L. R. (1999) *Progamotaenia abietiformis* sp. nov. (Cestoda: Anoplocephalidae) from *Onychogalea fraenata* (Marsupialia: Macropodidae) from Central Queensland. *Trans. R. Soc. S. Aust.* 123 (4), 143-147, 30 November, 1999.

Progamotaenia abietiformis sp. nov. is described from the small intestine of the bridled nailtail wallaby, *Onychogalea fraenata*, from Taunton National Park, Central Queensland. *Progamotaenia abietiformis* is most similar to *P. darwensis*, *P. lagorchestis*, *P. thylogale* and *P. queenslandensis* in having a prominently fringed velum and two uteri but differs from them in its size and the number of proglottides and testes. It also differs from most congeners in having the two uteri forming anteriorly directed arcs within the proglottis, not transverse but at approximately 45° and in the termination of the pygidium apparatus in two horns.

KEY WORDS: *Onychogalea fraenata*, cestode, *Progamotaenia*, bridled nailtail wallaby.

Introduction

The Anoplocephalidae Cholodkovsky, 1902 is a cosmopolitan family of cestodes occurring in mammals, birds and reptiles (Beveridge 1994). Species of the genus *Progamotaenia* Nybelin, 1917 occur exclusively in the small intestine and bile ducts of macropodoid and vombatid marsupials from Australia and Papua New Guinea (Spratt *et al.* 1991). Within the genus, *P. hameroffi* (Johnston, 1912) and *P. zschokkei* (Janicki, 1906) have been recorded from, amongst other macropodids, the two extant nailtail wallabies, *Onychogalea fraenata* (Gould, 1841) and *O. unguifera* (Gould, 1841) (Beveridge 1980). Recent collections of cestodes from *O. fraenata* from Taunton National Park in Central Queensland revealed a third species of *Progamotaenia* which is described below.

Materials and Methods

Cestodes collected from the intestine of a bridled nailtail wallaby were fixed in 10% formalin and then stored in 70% ethanol. Additional material deposited in the South Australian Museum, Adelaide (SAMA), AHC 25880 which had been relaxed in water prior to fixation in 10% formalin and then stored in 70% ethanol was also examined. Cestodes were stained with Carmine, dehydrated, cleared in X3B and

mounted in Permount or with Celestine blue, dehydrated, cleared in clove oil and mounted in Canada balsam. Serial longitudinal sections were cut at a thickness of 7 µm and stained with haematoxylin and eosin. The measurements of 10 specimens are given in millimetres as the range followed by the mean in parentheses. Drawings were made with the aid of a drawing tube. All specimens have been deposited in the SAMA.

***Progamotaenia abietiformis* sp. nov.
(FIGS 1-9)**

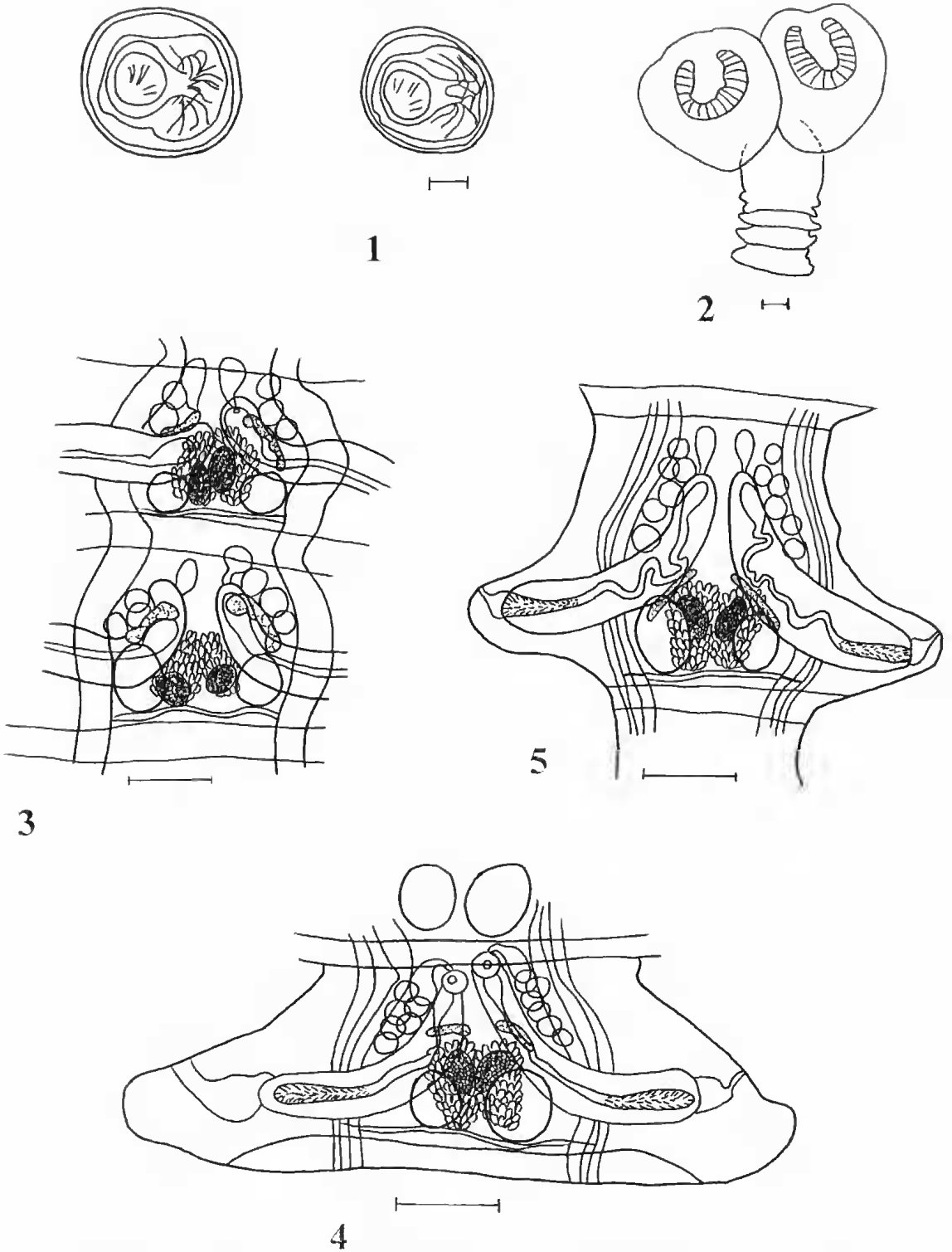
Types: Holotype from small intestine of *Onychogalea fraenata* (Gould 1841), Taunton National Park (23° 33' S, 149° 13' E), Queensland, coll. C. Turni, June 1996, SAMA AHC 28071; paratypes: whole mounts AHC 28072-28108, 28112-28114; numerous specimens spirit material AHC 31314; serial sections AHC 28109-28111; additional specimens, numerous specimens 15.iii. 1994 SAMA AHC 25880.

Description

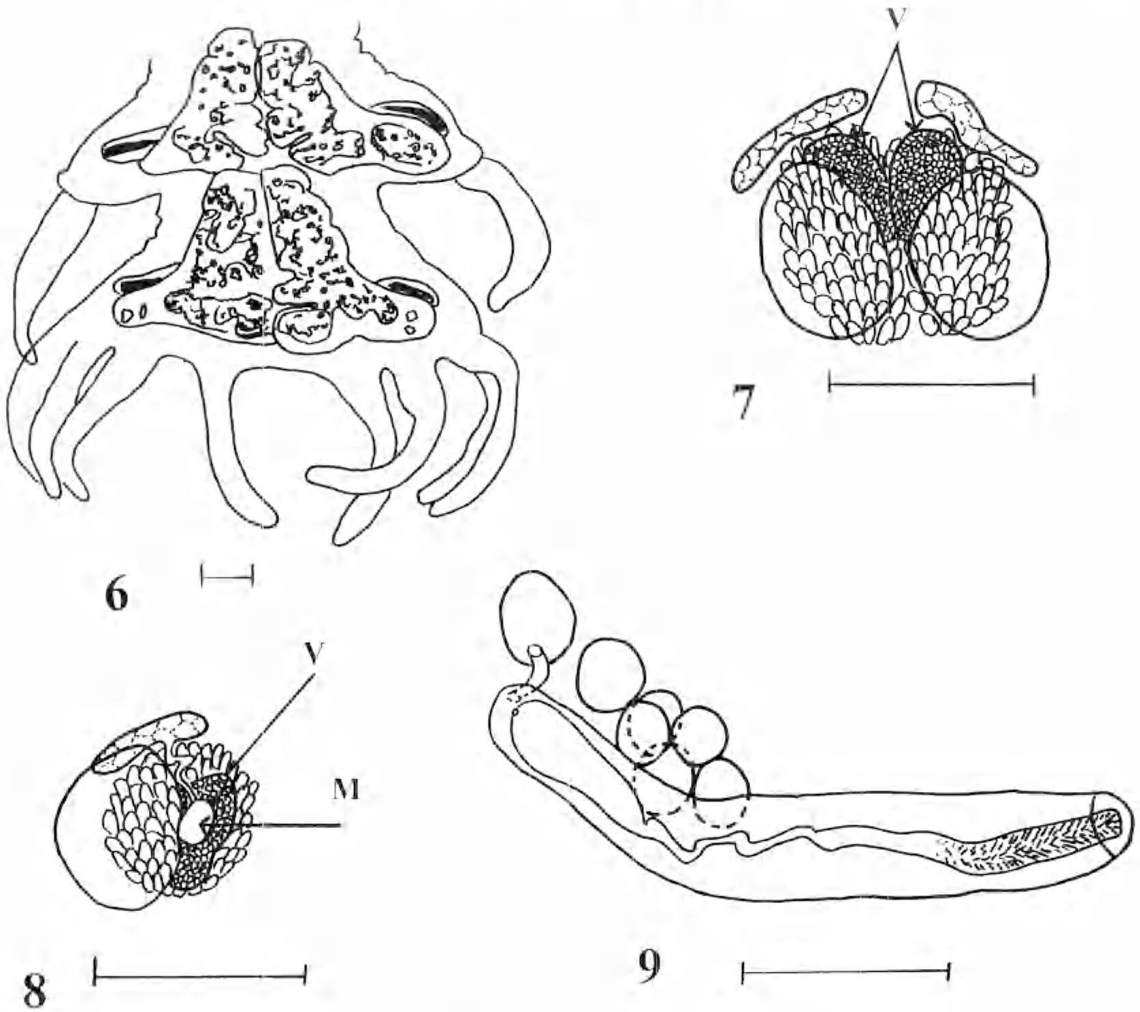
Length 5.92-12.4 (8); width 0.68-0.83 (0.77); scolex diameter 0.72-1.20 (0.88); sucker diameter 0.215-0.322 (0.272) x 0.215-0.291 (0.251); neck 0.05-0.34 (0.19); 34-57 (42) proglottides; mature proglottides 0.64-0.79 (0.72) x 0.14-0.38 (0.25); gravid proglottides 0.64-0.83 (0.76) x 0.22-0.46 (0.33); dorsal osmoregulatory canal 0.012-0.033 (0.019); ventral osmoregulatory canal 0.014-0.034 (0.021) in diameter; cirrus sac in mature proglottides 0.289-0.435 (0.333) x 0.0495-0.067 (0.059); cirrus

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Figs 1-5. *Progamotaenia abietiformis* sp. nov. 1. Eggs showing pyriform apparatus, the two horns not visible in all views. 2. Scolex. 3. Mature proglottides prior to and during uterus filling. 4. Mature proglottis, contracted. 5. Mature proglottis, fully extended. Scale bars = 0.01mm 1; 0.1mm 2-5.



Figs 6-9, *Progamotaenia albertiformis* sp. nov. 6. Gravid proglottides. 7. Female genitalia, dorsal view. 8. Female genitalia, optical section showing Mehlis' gland. 9. Male genitalia. Scale bars = 0.1mm. M = Mehlis' gland, V = vitellarium.

sac in gravid proglottides 0.268-0.487 (0.386) \times 0.049-0.074 (0.062); 11-13 (12) testes per proglottis; testis 0.031-0.039 (0.032) \times 0.025-0.039 (0.032); seminal receptacle 0.057-0.084 (0.073) \times 0.031-0.073 (0.058); vitellarium 0.030-0.069 (0.045) \times 0.018-0.039 (0.022); ovary 0.057-0.100 (0.073) \times 0.031-0.094 (0.051); Mehlis' gland 0.016-0.018 (0.017) \times 0.018-0.029 (0.024); egg 0.031-0.055 (0.042) \times 0.031-0.055 (0.040); pyriform apparatus 0.012-0.018 (0.015) \times 0.017-0.022 (0.020); oncosphere 0.012-0.014 (0.013).

Short, narrow cestode with relatively few proglottides. Broad scolex with four acetabulate suckers on peduncles extending antero-laterally. Anterior borders of suckers cleft. Proglottides craspedote with broad, fringed velum consisting of 12-16 tentacle-like projections overlapping adjacent proglottis. First mature proglottis 16-28 (22). Mature

proglottides with length to width ratio of 1:2-1:4.6. Gravid proglottides ratio of 1:1.7-1:4.1. Dorsal osmoregulatory canal situated lateral to ventral canal; ventral canal slightly wider than dorsal canal; transverse canals connecting both lateral canals posterior to seminal receptacle. Genital pore marginal opening into wide, long, simple genital atrium. Genital atrium bending anteriorly to open in mid-section of lateral margin of proglottides. Cirrus sacs long, thick-walled, crossing osmoregulatory canals dorsally then curving anteriorly and dorsally, terminating anterior to ovaries. Cirrus sacs almost meeting in centre of proglottis, running anteriorly parallel towards border of preceding proglottis. Cirrus heavily armed, widest at distal end, mid-section narrower and not as heavily armed, proximal end unarmed, sinuous leading into elongate internal seminal vesicle. External seminal vesicle elongate,

ventral to cirrus sac, extending anteriorly. Testes in two groups of 5-7, round to oval, 11-13 per proglottis, dorsal and ventral to cirrus sac, lateral and anterior to uterus, restricted laterally by osmoregulatory canals. Seminal receptacle large, ovoid, ventral to cirrus sac and lateral to vitellarium. Vitellarium ovoid to elongate, compact. In early mature proglottides, vitellarium dorsal to ovaries, lying over anterior half of ovary. In later mature proglottides, with fully everted cirrus, vitellarium lying over posterior half of ovary. Ovaries ovoid, lobulate, compact, ventral to seminal receptacle, touching, sometimes even slightly overlapping each other in centre of proglottis. Mehlis' gland ovoid, medial to ovary, between ovary and vitellarium. Uteri tube-like, paired in each proglottis, extending at approximately 45° towards centre of proglottis, ventral to ovaries, beginning to fill at proglottis 23-32 (27). In gravid proglottides uteri saciform, appearing almost longitudinal as diverticula extend mainly medially on posterior part of uteri. Towards posterior end of cestode uteri, in gravid proglottides, extend toward postero-lateral margin of proglottides crossing longitudinal osmoregulatory canals dorsally. Uteri abutting, even slightly overlapping in centre of proglottis. Egg spherical to elliptical, thick-shelled. Pyriform apparatus conical, terminating in two blunt horns (not visible in all views) with numerous long fine filaments. Cirrus developed by 20-27th (22) proglottis; internal seminal vesicle filled with sperm in 21-28th (23) proglottis; insemination occurs in 19-25th (21) proglottis; vaginal atrophy not seen.

Erymology

The name is derived from *abies*, the Latin name for fir tree, referring to the shape of the whole cestode.

Discussion

Progamotaenia abietiformis sp. nov. most closely resembles a complex of similar species, *P. dorcopsis*, *P. lagorchestis*, *P. thylogale* and *P. queenslandensis*, all of which have a fringed velum, paired uteri, testes in two groups and an external seminal vesicle (Beveridge 1985). It differs from this complex in its small size (up to 12.4 mm compared with 32 mm or longer in the other species), small number of proglottides (up to 57 compared with at least 95 in the other species) and the small number of testes (11-13 compared with at least 36 in the *P. lagorchestis* species complex) (Beveridge 1985). *Progamotaenia spareii*, which also has a fringed velum, paired uteri and testes in two lateral groups but no external seminal vesicle, is a small cestode with few proglottides and a small number of testes (Beveridge

1980). However, *P. abietiformis* is smaller (5.92-12.4 mm compared with 26-30 mm), has fewer proglottides (34-57 compared with 71-85), fewer testes (11-13 compared with 30-40) and has a velum with 12-16 tentacle-like projections compared with 25-35 tongue shaped projections for *P. spareii* (Beveridge 1980). Other distinctive features of *P. abietiformis* are the long cirrus sacs almost meeting in the mid-line and the ovaries which are central and abut. With regard to the position of the female genitalia *P. abietiformis* is most similar to *P. aepyprymni*, whose fully developed ovaries almost abut (Beveridge 1976).

In the genus *Progamotaenia* the uterus is usually transverse (Beveridge 1994) and the pyriform apparatus normally does not end in horns except for *P. diaphana* (Beveridge 1976) and *P. gynandrolineorix* (Beveridge & Thompson 1979). In *P. abietiformis*, however, the uterus in the mature proglottides is at 45° and the pyriform apparatus ends in horns.

Progamotaenia abietiformis can be distinguished from *P. bancroftii* (Johnston, 1912) and *P. zschokkei* (Jaritcki, 1906), the other species found in *O. fraenata*, by size (*P. abietiformis* is much smaller) and the shape of scolex since only *P. abietiformis* has suckers on peduncles extending antero-laterally. *Progamotaenia bancroftii* has no pyriform apparatus. *P. zschokkei* has a single uterus and both have a large number of testes (more than 60 compared with 11-13 for *P. abietiformis*) (Beveridge 1976, 1980).

The description of *P. abietiformis* is based on the collection of material from two specimens of *O. fraenata* from the Taunton National Park, Central Queensland. Since *O. fraenata* is an endangered species, the last natural population being confined to Taunton National Park, *P. abietiformis* is also an endangered species.

Cestodes of the *P. lagorchestis* species complex are four closely related but distinct species (Beveridge 1985). Their hosts, however, *Thylogale stigmatica* (Gould, 1860) (*Progamotaenia queenslandensis* and *P. thylogale*), *T. hillardii* (Desmarest, 1822) (*P. thylogale*), *T. thetis* (Lesson, 1827) (*P. thylogale*), *Lagorchestes conspicillatus* (Gould, 1842) (*P. lagorchestis*), *Dorcopsis luctuosa* (D'Albertis, 1874) (syn. *D. veterum* see Smales 1997) (*P. dorcopsis*) and *Macropus rufogriseus* (Desmarest, 1817) (*P. thylogale*) (Beveridge 1985; Beveridge & Thompson 1979), are not. Macropodines can be separated into two clades with one clade consisting of the New Guinean forest wallabies, *Dorcopsis* and *Dorcopsulus*, and the other including the genera *Macropus*, *Lagorchestes*, *Thylogale* and *Onychogalea* (Burk *et al.* 1998). Although *L. conspicillatus* is the only host whose range currently overlaps that of *O. fraenata* (Burbidge & Johnson

1995; Evans & Gordon 1995) former distributions of each of the hosts, including fossil material of *Dorcopsis* spp. from Australia (Calaby 1995; Flannery 1995; Johnson & Vernes 1995), are indicative of the potential for host switching in the past.

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